

## Claims

- 1 1. An optical instrument lighting system, comprising:  
2 a first light source having a first wavelength for verifying a stain used on a cytological  
3 sample; and  
4 a second light source having a second wavelength for viewing the cytological sample,  
5 wherein the first wavelength is different from the second wavelength.
- 1 2. The system of claim 1, wherein the first light source comprises a red LED.
- 1 3. The system of claim 1, wherein the second light source comprises a green LED.
- 1 4. The system of claim 1, wherein the second light source comprises an array of multiple  
2 green LED's.
- 1 5. The system of claim 1, wherein the first wavelength is between about 690 nm and about  
2 750 nm.
- 1 6. The system of claim 1, wherein the second wavelength is between about 500 nm and  
2 about 600 nm.
- 1 7. An LED array for use with a system for imaging a stained cytological sample, the  
2 imaging system comprising:  
3 a red LED for verifying the stained sample was stained with a predetermined stain; and  
4 a green LED for illuminating the cytological sample for imaging.
- 1 8. The LED array of claim 7, comprising multiple green LED's
- 1 9. The LED array of claim 7, wherein the LED array operates on low voltage.
- 1 10. The LED array of claim 7, wherein the LED array operates on 5 volts DC.
- 1 11. A system for imaging a cytological sample including nuclear material and cytoplasmic  
2 material, the system comprising:  
3 an optical instrument;  
4 a first light source having a first wavelength for verifying that the sample was stained  
5 with a specific stain, wherein the specific stain transmits light at a wavelength of about 720 nm;  
6 and  
7 a second light source having a second wavelength for imaging the sample, wherein the  
8 nuclear material transmits light at a wavelength of about 570 and the cytoplasmic material is  
9 generally minimally visible to the system.

- 1 12. The system of claim 11, wherein the stain is about a 0.3% thionin solution.
- 1 13. The system of claim 11, wherein the cytoplasmic material is visible to an observer.
- 1 14. A method for imaging a cell, the method comprising the steps of:
- 2 staining nuclear material of the cell;
- 3 staining cytoplasmic material of the cell;
- 4 illuminating the cell with a first light source with a first wavelength for verifying that a
- 5 specific stain was used; and
- 6 illuminating the cell with a second light source with a second wavelength to image the
- 7 nuclear material.
- 1 15. The method of claim 13, wherein the first wavelength is different than the second
- 2 wavelength.